

Math TODAY™

Teacher Edition



NO. 1 IN THE USA

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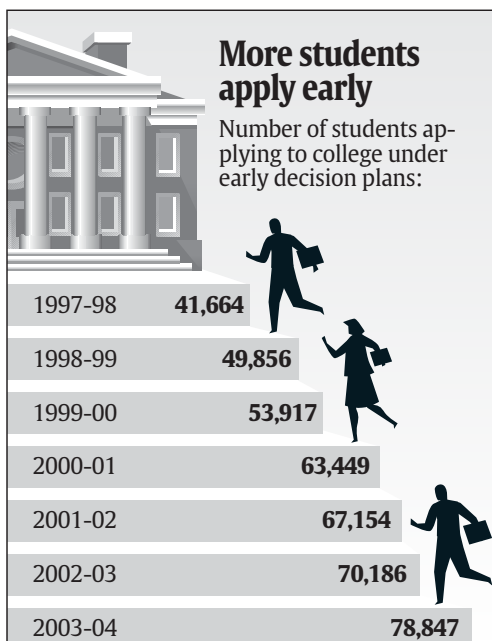
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More students apply early

By: Bob Tower



Source: The College Board

By Bob Laird, USA TODAY

Activity Overview:

The USA TODAY Infograph "More students apply early" will have students explore scatterplots and independent and dependent variables. Students will determine the best-fit regression model for the real-life data set and then use the model to make a prediction. The meaning of slope (rate of change) and y-intercept are explored in the context of the problem. Students will find the mean value of the number of students applying under the early decision plan.

Concepts:

- Create scatterplots of real-life data
- Utilize linear functions, slope and y-intercept
- Analyze, evaluate, and synthesize real-life data
- Determine the mean of a set of data

Activity at a Glance:

- Grade level: 9-11
- Subject: Algebra
- Estimated time required: 15-20 minutes

Materials:

- TI-83 Plus family or TI-84 Plus family
- Overhead view screen calculator for instruction/demonstration
- Student handout
- Transparency

Prerequisites:

Students should:

- know how to create scatterplots with the handheld.
- know how to use the handheld to determine the mean value of a data set.
- know how to use the regression capabilities of the TI handheld.
- have prior experience and knowledge with linear functions.
- have prior experience and knowledge with slope and y-intercept meanings.



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This activity was created for use with Texas Instruments handheld technology.

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Objectives:

Students will:

- create a scatterplot of a data set using appropriate values for the independent and dependent variables.
- explore linear model for a data set and explain what slope and y-intercept mean.
- find the mean (average) value for a data set.

Background:

When looking at data, students need practice modeling real-life problems. In this activity students will work with bivariate and univariate data to numerically and graphically describe the relationship seen in the USA TODAY Infograph "More students apply early."

Preparation:

- Provide one graphing handheld for each student.
- Each student should have a copy of the corresponding student activity sheet.

Classroom Management Tips:

- Students will have a better understanding of how to read the graphic and retrieve data if you use the transparency for a class discussion before the students start working.
- Students can work individually or in small groups on this activity. Working in groups is especially helpful as they learn the various features of the handheld.
- Allow students to talk about the "how" and "why" approach they used to find the solutions.
- This is a good time to talk to the class about limitations of using mathematical models to predict values outside of the data set.

Data Source:

The College Board

National Council of Teachers of Mathematics (NCTM) Standards*:

Algebra Standard

- Use mathematical models to represent and understand quantitative relationships.
- Analyze change in various contexts.

Measurement Standard

- Understand measurable attributes of objects and the units, systems, and processes of measurement.

Data Analysis and Probability Standard

- Select and use appropriate statistical methods to analyze data.

Connections Standard

- Recognize and apply mathematics in contexts outside of mathematics.

Representation Standard

- Use representations to model and interpret physical, social, and mathematical phenomena.

*Standards are listed with the permission of the National Council of Teachers of Mathematics (NCTM), www.nctm.org. NCTM does not endorse the content or validity of these alignments.

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Activity Extension:

- Invite counselors from your school to talk to the class about early application to college.
- Have students contact local universities/colleges about their policies on the acceptance of early applications.
- Encourage students to go to The College Board website, www.collegeboard.com, and explore the early application process.
- Encourage students to visit USA TODAY Education Online and explore the College and Career Quest resources.

Curriculum Connections:

- Speech
- College and Career Exploration

Additional Resources:

- Student handout
- Transparency
- TI Technology Guide, for information on the following: TI-83 Plus family, TI-84 Plus family and List Editor
- TI-Navigator™ Basic Skills Guide for information on using the TI-Navigator Classroom Learning System

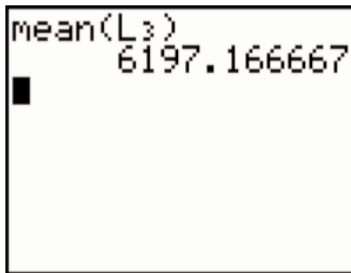
Teacher Notes:

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Assessment and Evaluation:

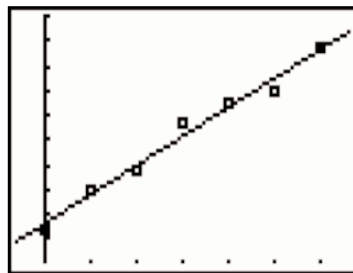
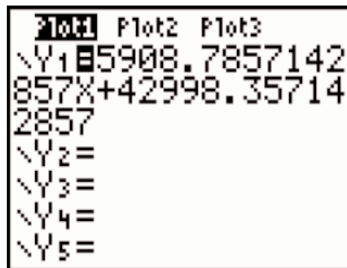
Q. What is the average increase in the number of students that are applying early for the time period shown in the USA TODAY Infograph?

A. The calculation for the average increase per year in the number of students is shown below. This would tell us that on average about 6197 students are applying for the early decision plan according to the data.



Q. What is the linear function modeling this data set? What does the slope and y-intercept mean in the early decision-year scenario?

A. The screen shots show the results from the handheld for the linear model. The slope is 5909 and means that there is an increase of 5909 students per year for this time period. The y-intercept means that in 1997-1998 there were about 42998 applying for early decision.



Q. Determine the total number of students that are expected to apply for early decision for the period from 2004 through 2007.

A. Values shown are found using the linear model.

Year	2004-2005	2005-2006	2006-2007	Total
Number of students	84360	90269	96177	270806